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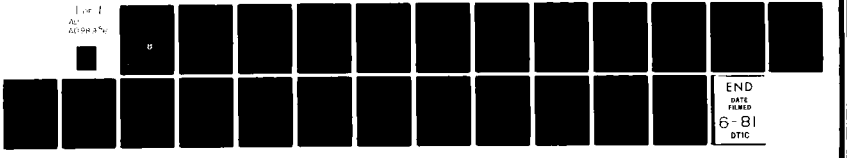

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USER'S MANUAL FOR SEEK TALK FULL SCALE ENGINEERING DEVELOPMENT LIFE CYCLE COST (LCC) MODEL VOLUME 1 - LCC MANAGEMENT

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This document is a manual for the application of the computerized Life Cycle Cost (LCC) Model designed for the Full-Scale Engineering Development (FSED) Phase of the SEEK TALK Program. FSED contractors will use the model to perform cost estimates, identify cost drivers and make trade and other cost-related analyses. The manual assists users in establishing input parameter values, making LCC calculations and utilizing results. It also describes how to prepare computer inputs and run the model in either the interactive or batch mode. Volume I is entitled Life Cycle Cost Management,

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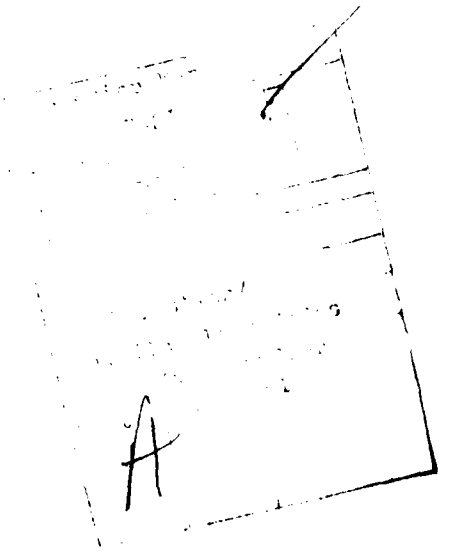

PREFACE

The computerized Life Cycle Cost (LCC) Model for the Full Scale Engineering Development (FSED) Phase of SEEK TALK is a revised and extended version of the LCC Model for the Advanced Development Phase, which Model was itself an elaboration of the Model used in the first, or Design Studies, Phase of the program. This document is the User's Manual for the FSED LCC Model.

The Manual is contained in two volumes. Volume I, entitled Life Cycle Cost Management, covers LCC policies for SEEK TALK, the nature and application of the Model, and instructions to contractors for carrying out FSED LCC tasks. Volume II, entitled Model Equations and Model Operations, first describes the overall structure of the LCC Model, the cost element equations, the sensitivity analysis capability and the repair level analysis capability. Next it provides values for Air Force input parameters and instructions for contractor inputs, general operating characteristics of the Model and detailed operating procedures. Finally, four appendices contain a glossary of variables, illustrative computer runs, instructions for calculating modification/installation cost elements and instructions for using the Model for calculations involving Interim Contractor Support and Centralized Intermediate Maintenance Facilities.

An earlier version of this document was prepared by MITRE for the Air Force Electronic Systems Division, and issued by them as Attachment 15 to the FSED RFP for SEEK TALK, namely, RFP No. F19628-80-R-0184, dated 21 July 1980.

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SECTION 1

LIFE CYCLE COST POLICIES FOR SEEK TALK

Volume I of the User's Manual describes life cycle cost policies for SEEK TALK, summarizes the nature of the FSED life cycle cost model, and provides instructions to contractors for carrying out FSED LCC tasks.

1.1 SEEK TALK Acquisition Depends Upon Life Cycle Cost

The Air Force has established that life cycle cost will be a key factor in the selection of the production contractor, as well as in determining whether SEEK TALK will be approved for production. Life Cycle Cost (LCC) management techniques and controls have been and will continue to be emphasized in all phases of the SEEK TALK Program.

Contractor management should be concerned with the LCC program because cost will be a major factor in determining the success of their efforts.

To make LCC work for him, the manager needs to give cost considerations high priority. He should give prominence to LCC in the program structure, develop an awareness of cost in all project personnel (and especially the design engineers), see that cost targets are formulated and used to guide the work, and emphasize cost consideration changes -- including cost-reducing design -- in all program reviews.

1.2 LCC Actions That The Government Has Taken To Date

The Government has emphasized the importance of LCC considerations since the inception of the SEEK TALK program. It has demonstrated this emphasis through the following specific actions taken to date:

- Identified SEEK TALK as an LCC program
- Developed an approach to Life Cycle Cost controls that builds upon the success of past programs, notably the ARC-164/ARC-XXX program.
- Established LCC policies for SEEK TALK and an LCC program plan; determined that LCC will be the cost factor used in production source selection.

- Encouraged the contractor to challenge government requirements in the interest of reducing cost.

- Developed the concept of multiple configurations - Full-up (Type I or maximum), Partial array (Type II or intermediate) and Modem-only (Type III or minimum) - in order to establish lowest LCC designs meeting the operational requirements of each platform type.

- Provided Life Cycle Cost Models for contractor use in the Design Studies and Advanced Development phases.

- Developed early working relationships with host platform SPOs and ALCs; set up integration study contracts for four platforms: F-15, F-16, A-10, OV-10.

1.3 LCC Actions Taken to Date by Contractors

The SEEK TALK development contractors have conducted their design work with emphasis on program cost reduction and control. Design concepts have been formulated with emphasis on cost considerations, and specific design decisions have been made using LCC trade studies. The following actions contributed to these efforts:

- Developed mechanism for cost estimation, cost tracking and control.

- Partitioned LCC targets, and compared results with cost element estimates.

- Identified known and potential cost drivers in each major cost area.

- Projected LCC with accuracy estimates for input parameters, and detailed supporting rationale.

- Suggested specification or ground rule changes that would reduce cost.

- Related component quality level to LCC; made preliminary component selection for low LCC.

- Proposed aircraft antenna locations and antenna designs selected with consideration of installation cost and added fuel cost.

1.4 Purpose of LCC in FSED and Production Phases

The overall purpose of LCC in the SEEK TALK program is to ensure that the systems, as designed by the development contractors, are affordable by the Air Force. Affordability is gauged on a total life cycle cost basis, including the several cost components of both acqusition and ownership.

During the early portion of the FSED phase, LCC techniques will be used to identify and support trade and other studies leading to low LCC designs. After Critical Design Review, continuing cost controls, pressure against possible cost increases and incremental cost reductions where possible, will utilize LCC tracking and analysis efforts. It is recognized that estimates of the input parameters for the LCC calculation cannot be made with high accuracy, particularly before the FSED models have been fabricated and tested. Hence, a rigorous mathematical optimization is not possible. Nevertheless, the contractor can, using LCC techniques, identify the design decisions that will help minimize LCC.

At the end of FSED, contractor projections of LCC will be important factors in production source selection. Contractual incentives for the successful production contractor will depend on his actual LCC performance vs. his LCC prediction. Performance will be determined via actual demonstration, including field measurements and statistical tests to determine reliability, maintainability, operability and other LCC drivers.

At the start of the FSED contract effort, the LCC work defined by the FSED SOW and this User's Manual, and the FSED Phase LCC Model defined by this Manual, shall supersede the LCC work defined by the Advanced Development Phase SOW and associated User's Manual.

SECTION 2

NATURE AND APPLICATION OF THE FSED PHASE LCC MODEL

2.1 Role of the Model in FSED Phase

The FSED Phase Life Cycle Cost (LCC) Model is a major tool that contractors shall use to reduce and control total program cost, including costs of both acquisition and ownership. It shall be utilized by each contractor in the early part of FSED (i.e., prior to Critical Design Review) to establish cost targets for LCC elements and subelements, to identify cost drivers, and to make trade studies within the general domains defined by Air Force performance specifications and the contractor's FSED design concept. In addition, the model will enable the contractor to study alternative logistics support approaches and alternate repair levels for equipment items.

Subsequent to Critical Design Review, however, the detailed designs of equipment Configuration ITEMs and Computer Program Configuration ITEMs will have been established. The model shall then be used for tracking and controlling LCC during the construction and test stages and for evaluating ECPs. It shall also be used to refine operational and support procedures.

The FSED Phase Model will also be used by the Air Force for two purposes. It will provide a means for estimating major elements of LCC, both for developing funding requirements and for investigating the cost consequences of alternative program choices. It will also be used to define standards for evaluating contractor LCC estimates including use in source selection.

The FSED Phase LCC Model, as described in this manual, is similar in basic structure and in level of detail to the Advanced Development Phase LCC Model. Any differences are described subsequently in Section 4 of Volume II.

2.2 Role of the Model in the Production Phase

The Air Force is planning to utilize life cycle cost as a major criterion in source selection for SEEK TALK production. Offerors will be required to predict SEEK TALK LCC, using a prescribed LCC Model and prescribed values for Air Force input parameters to the model. Offerors will estimate contractor input parameters (using Air Force instructions and ground rules), and will utilize these estimates to make projections of LCC.

Means will then be used to measure and verify the LCC performance of the contractor's production equipment. A financial incentive, positive or negative depending upon LCC performance vs LCC prediction, will be administered as stated in the production contract.

Each key contractor input parameter used to project LCC will be verified or controlled in some way to measure actual contractor performance and compare it with the previous parameter estimate. The method of verification or control, and the timing of the verification or control process, will depend upon the nature of the parameter. Four different approaches will be utilized, as described below.

(1) For parameters related to terminal production prices, or item production prices, the fixed price incentive production contract itself will provide suitable controls.

(2) For parameters defined by the specifications, fixed by the contractors design, and easy to observe or measure, inspection of the production product will be sufficient for verification. Examples of such parameters are number of antenna elements, dimensions of electronic boxes and weights of individual items.

(3) Parameters at least partly defined by the specifications, but having values that are difficult for the contractor to control and to measure accurately, may require a more complicated means of verification. Thus for reliability and maintainability parameters, for example, statistical tests would be carried out on samples of production units operating in the field.

(4) Modification/installation parameters, such as labor hours to install a terminal on each type of host platform, will require a special verification process. The nature of this process will depend upon the provisions of the FSED contract regarding Class II modifications - and especially, the degree of responsibility defined for the FSED contractor.

The FSED Phase LCC Model will be simplified by the Air Force (and MITRE) prior to production proposal preparation. The simpler version will be used in Production source selection and in providing the basis for incentive reimbursement. In particular, the following changes in the model will be made:

- o Consideration of costs over which the contractor has little or no control will be eliminated.

- o These costs or cost parameters found during the FSED Phase to have an insignificant effect on LCC will be eliminated.

- o The model will be updated to reflect current Air Force plans for installation, deployment, operation and maintenance.

- o Problems and deficiencies arising in the use of the FSED Phase Model will be corrected.

2.3 Nature of Model Inputs

Model inputs are combinations of government-furnished parameters and contractor-furnished parameters.

Examples of government parameters are production quantities and rates and configuration mixes, planned deployment and operating characteristics, utilization rates, and fixed properties of the logistics support system such as pipeline times and labor rates.

Examples of contractor inputs are the pertinent characteristics of his system design, including the system breakdown into logistically supportable "ITEMs" - namely, Line Replaceable Units (e.g., black boxes) and Shop Repairable Units (e.g., printed circuit board assemblies). Other contractor parameters define unit production costs, modification installation cost elements, requirements for operational labor and impact of new antennas on platform drag and hence on fuel consumption. For each ITEM, the contractor also defines failure rate and maintenance parameters, support equipment characteristics, and parameters relating to training, item inventory management and technical orders.

The major categories of government and contractor inputs to the LCC Model are given in Table 2-1. (For a complete listing of all input parameters, see Table 8-II in Volume II of this User's Manual.)

TABLE 2-I

MAJOR CATEGORIES OF INPUT DATA BY TYPE AND BY SOURCE
(Sources: Government, Contractor)

System-Wide Parameters (File (1))

Government: Labor Rates, pipeline times, unit cost factors, planned inventory utilization period, etc.

Contractor: Training and Tech. Order data, FSED cost.

Deployment of Host Platforms (Files (2) and (6))

Government: Operational bases by type and by theatre.
Platform deployment at bases.

Platform - Oriented Parameters (Files (3), (4), (5), (6))

Government: Platform operating and utilization data; thrust/fuel relationships. Terminals per platform. Installation modes; recurring fixed modification/installation cost.

Contractor: Operational labor hours; drag per antenna.
Unit terminal production cost.
Non-recurring modification/installation cost.
Recurring A-Kit cost and installation hours.

ITEM-Oriented and Support Equipment-Oriented Parameters (File (7), (8), (9), (10), (11))

Contractor: Support Equipment characteristics; Tech. Order pages.
ITEM definitions and properties; What SRUs are in each LRU.
ITEM reliability and maintenance data; Tech. Order and Training data.
What Support Equipment is used in repair of each ITEM.
What the ITEM configurations are for each platform type.

2.4 Significance of Model Outputs

The outputs of the LCC Model provide an overall summary by cost classification, breakdowns in significant cost areas, tabulations showing sensitivity of results to variations in selected parameters and showing the results of an analysis of repair level options. These output tables will assist the design engineer, the installation/integration engineer and the logistics support planner in determining the cost consequences of their decision alternatives A brief description of the Model outputs will suggest how they can be used by the contractor in his FSED work.

The outputs of the Basic LCC Calculation are given in seven tables as follows:

(1) Summary by Cost Element: Gives a summary of total acquisition and ownership costs in accordance with a standard cost breakdown structure.

(2) Platform Modification/Installation Costs: Provides breakdowns of modification/installation cost by expense classification and platform type. This highlights what platforms and installation areas (subsystems) are the major cost contributors.

(3) Operation and Logistics Support (O&S) Cost Elements: Provides breakdowns of each of eleven O&S cost elements by initial vs recurring expense, and by type of operational base or maintenance location. This shows phasing of these costs and the locations where they will be incurred.

(4) ITEM-Specific Costs and Maintenance Characteristics: Provides for each contractor-defined ITEM - i.e., Line Replaceable Unit (e.g., black box) and Shop Repairable Unit (e.g., printed circuit board assembly) - a breakdown of its contribution to failures, its allocated maintenance costs, and its consumption of spares (units and dollars).

(5) Support Equipment Requirements and Costs: Shows total required units of support equipment of each contractor-defined type, the associated cost, and a breakdown of units by type of base or maintenance location.

(6) Platform/Terminal Cost and Failure Rate Data: Shows for each government-defined platform type: numbers of platforms, terminals per platform, aggregate production cost and modification/installation cost of these terminals

for the contractor's design, several measures of failure rate for that design, and mean hours between failures.

(7) Manpower Requirements: Shows manpower requirements for maintenance and for preparation of item management data, broken down by type of operational base and by base vs depot. It also summarizes manpower needed for training.

The outputs of the Sensitivity Analysis are of two types. First, the change in LCC is given for a 25 percent change in each of six selected system-wide parameters - all unit costs, all failure rates, all false pull* rates, all fault isolation and repair times, all repair materials costs and modification/installation labor hours. Second, the change in LCC is given for defined changes in each of eight selected ITEM-specific parameters, and in each case, the ITEMs are then arranged in order of significance. The ITEM-specific parameters are: failure rate, unit cost, false pull rate, repair materials cost, intermediate repair fraction, depot repair fraction, and condemnation rate. In addition, the ITEM-specific analysis investigates whether any SRUs would be cheaper to maintain if they could be treated logistically as LRUs.

The last type of output is produced by the Repair Level Analysis routine. This develops for each contractor-defined ITEM (Line Replaceable Unit or Shop Repairable Unit) a recommended maintenance approach, namely, repair at base, repair at depot or discard.

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* A "false pull" is defined as a removal of an LRU from an installation because of a suspected equipment failure, which LRU, however, does not exhibit any fault in subsequent test in the shop.

SECTION 3

INSTRUCTIONS TO CONTRACTORS FOR CARRYING OUT FSED LCC TASKS

The LCC tasks that the contractors shall carry out in the FSED Phase are established by the FSED Statement of Work (SOW). The FSED Phase LCC Model is a major tool that shall be used by the contractor in performing these tasks. The descriptions below summarize how the Model will be employed for each LCC task. Details of what types of computer runs will be made, and how input parameters will be established, are given in Volume II of this manual - Sections 8, 9, and 10 supplemented by Appendices III and IV. Reporting requirements are defined in the Contractor Data Requirements List.

The four LCC tasks in the FSED SOW have the following titles:

(1) Support Concept Analysis
(2) LCC Verification
(3) Trade Analyses
(4) LCC Controls

3.1 Support Concept Analysis

In this task, the contractor shall evaluate and recommend integrated support concepts for the production phase of SLEK TALK considering the baseline level of deployment as defined in Section 5 of Volume II of this User's Manual. These concept recommendations shall include two phases of deployment, initial and mature, to capture cost differences that may result from changes in support approach between phases.

The contractor shall evaluate, using the LCC Model, the various aspects of interim contractor support vs. organic government support for the initial deployment phase. Interim contractor support may involve some kind of warranty or guarantee arrangement. Costs shall be estimated for interim contractor support periods (i.e., initial phases) of two, three, four and five years. The costs that are associated with changeover from contractor to organic support shall also be included. Appendix IV of Volume II of this User's Manual describes how the LCC Model may be adapted to consideration of deployment phases, and of contractor as well as organic support.

In addition to looking at interim contractor support, the contractor shall evaluate the cost characteristics of lifetime contractor support, at least at the depot level.

The contractor shall also evaluate, using the LCC Model, the suitability and cost effectiveness of using centralized intermediate maintenance facilities (CIMFs), versus independent base maintenance, either during the mature deployment phase only, or during both deployment phases. The use of CIMFs for the European theatre can be investigated by changing the choice of logistic configuration in Table 8-IV (defining Input File (2)) in Volume II of this User's Manual - See Section 8.2.2. Further information on making calculations for CIMFs is given in Appendix IV of Volume II.

The contractor should also note that the FSED SOW requires him to conduct a Repair Level Analysis (RLA), using the LCC Model. The RLA utilizes the procedures described in Section 7 of Volume II of this User's Manual. RLA should be used by the contractor to influence design decisions. Also, the RLA program aids the contractor in establishing appropriate (and approximately optimum) values for contractor inputs of parameters RTS, NRTS, and COND for support concept studies. (See Appendix I, Glossary, in Volume II for definitions of these variables.)

It is expected that the evaluation of the prototype and subsequent production model packaging concepts would be evolved in conjunction with the efforts of the Support Concept Analysis and RLA tasks. Further, the design and implementation approach for both peculiar and common support equipment should be arrived at in conjunction with the analysis of support concepts.

Consideration shall be given to the tactical nature of the on-equipment and base level off-equipment support. ("On-equipment" refers to maintenance performed on or at the host platform; "off-equipment" refers to maintenance performed at a base or depot shop.) These analyses should include the recognition of the requirement to deploy to worldwide locations at minimal notice. Furthermore, the contractor should recognize that tactical resources to support field operations are often minimal. Therefore, size and complexity of support assets can have a detrimental impact on mission success. This suggests that there are several areas of concern which should be recognized by both equipment designers and support planners. A current major concern is the availability and ease of airlift. This applies to both the support deployment package (support equipment, tech data, specialized personnel) and the War Readiness Spares Kit (WRSK), a reserve of spares to permit unsupported operation for a specified period of time (e.g., 30 days). Interdependence of support equipments shall also be considered when analyzing and recommending various support concepts.

3.2 LCC Verification

In this task, the contractor shall recommend to the government a methodology for verifying selected LCC parameters. These parameters, which relate to modification/installation, operations and support, are contractor-furnished inputs to the LCC Model. They are, moreover, parameters that have a major impact on LCC, and that may not be readily verifiable by the government at the time of production source selection.

These selected parameters are of the six types listed below:

(1) Recurring Modification/Installation Parameters: AKIT, MIMH
(2) Predicted Mean Times between Failures: PMTBF
(3) Operation Time Factors: MMPD, MMPH
(4) Maintenance Parameters: IPCF, RIP, RM
(5) Repair Level Designators: RTS, NRTS, COND
(6) Mean Maintenance Times: RMH, BCMH, BMH, DMH

(See Volume II of this User's Manual for definitions of all of these parameters.)

The contractor shall consider such verification approaches as warranties (e.g., Reliability Improvement Warranty) and guarantees (e.g. guarantees of operation cost, support cost or MTBF). The contractor shall evaluate and propose data gathering methodology, verification processes, and positive and negative incentive arrangements. (Technical data on warranties and guarantees as applied to government contracts will be supplied to a contractor upon his written request.)

Where sampling techniques are recommended the contractor shall develop a sampling plan which reflects the rationale for the selection of a specific distribution and the expected parameters of that distribution to include confidence limits. A cost-benefit analysis shall be done for each parameter selected for sampling to determine the range and depth of sampling to be accomplished.

3.3 Trade Analyses

In this task the contractor shall identify and carry out modifications in his FSED design that will reduce cost. Such modifications will be identified through trade studies using the LCC Model and will be carried out in the areas described below.

(a) Reliability and Maintainability. The contractor shall investigate the variation of LCC with design changes impacting predicted mean time between failures (PMTBF) and mean maintenance times (RMH, BCMH, BMH, DMH), to determine what design will minimize LCC. Changes to be investigated are changes in type and quality level of selected components, changes in packing density, and other related design changes within the overall scope of the contractor's FSED design concept.

(b) Installation Characteristics. The contractor shall identify design choices, within the overall framework of his FSED design concept, that impact the cost of host platform modification and SEEK TALK installation for the platforms and terminal configurations listed below. In particular, design choices impacting the recurring mod/installation labor hours (MIMH) for antennas, cabling, control panel and electronic boxes should be emphasized. In making this study, the contractor shall utilize data on the following airborne platforms: F-16, A-10, OV-10 (all full-up or Type I configuration); F-4, F-15 (partial array or Type II configuration); and E-3A (modem only). The contractor shall also utilize data on these ground platforms: FACP, CRC and TACP.

(c) Timing Net Approach. The contractor shall investigate the variation of LCC with different approaches to the timing net and master clock terminal designs--within his overall sytem design concept. Changes impacting operational labor (MMPD, MMPM) as well as production and other cost elements shall be considered.

The contractor shall consider at least the following issues in his analysis:

- o What fraction of the airbases and ground sites for SEEK TALK equipment will require master clocks.
- o Whether these clocks will or will not be all identical.
- o What timing net redundancy will be required.
- o What method of distribution to prime mission equipment (PME) terminals - airborne and ground - will be used.
- o How the above will impact on operational labor to initialize PME terminals.

(d) Commonality. The contractor shall determine the LCC impact of various degrees of commonality, a) between functionally similar SRUs, and b) both between SRUs and between LRUs, for the

platform types identified below. On the basis of this determination the contractor shall recommend what degree of commonality is most appropriate for SEEK TALK. Factors that shall be taken into account are at least the following:

- o Differing form/fit characteristics of different host platforms.
- o Differing performance requirements (e.g., amount of conferencing, timing requirements) specified for different host platform classes.
- o Differing operational environments and electrical integration characteristics.
- o Differing AM radios that must be interfaced.
- o Differences between the ground and airborne terminal requirements, taking into account environment, usage rate, effects on support capabilities.

In carrying out the commonality studies, the contractor shall make use of data on the following platform types: F-4, F-15, F-16, A-10, OV-10, E-3A, FACP, CRC and TACP. These are designated "basis" platforms, since they furnish the foundation or basis for calculation of modification/installation costs for the system.

3.4 LCC Controls

This task integrates the efforts of the foregoing LCC requirements into a coordinated LCC program, tracks actions taken to reduce costs, and provides a running documentation of results. The contractor shall employ the LCC Model, and the detailed procedures outlined in Vols. I and II of this User's Manual, in carrying out the tasks defined below.

(a) Assembling the LCC Program Baseline. The contractor shall utilize the results of Tasks 1 through 5 of the Advanced Development Phase SOW (Annex D), the material presented in his proposal for FSED, and all relevant guidance provided by the Government (including the FSED Phase LCC Model and User's Manual), to assemble an LCC program baseline cost estimate. This baseline estimate shall incorporate the data elements shown in Table 3-1.

Table 3-I
COST ELEMENTS FOR LCC TARGETS

A. Breakdown of LCC by Type of Expense

RDT&E

Equipment Acquisition
- Prime Mission Equipment, Airborne
- Prime Mission Equipment, Ground
- Timing Net Equipment

Modification/Installation
- Non-Recurring Cost
- Recurring Labor Cost
- Recurring Group A Kits

Initial Support Acquisition
- Initial Spares
  - Base
  - Depot
- Support Equipment*
- New Item Entry
- Initial Training
- Initial Technical Data

TOTAL INVESTMENT COST

Recurring Support
- Replacement Spares
  - Base
  - Depot
- On Equipment Maintenance
- Off-Equipment Maintenance
- Support Equipment Maintenance
- Item Inventory Management
- Recurring Training
- Technical Data Maintenance

Operations Cost
- Operational Labor
- Added Fuel Consumption

TOTAL OWNERSHIP COST

TOTAL LCC

*Includes cost of ATE programming and adaptors.

B. Supporting Breakdown - Equipment Acquisition by Terminal Configuration

Prime Mission Equipment, Airborne
- Type I (Maximum or full-up)
- Type II (Intermediate or partial array)
- Type III (Minimum or modem only)

Prime Mission Equipment, Ground
- Type II (partial array)
- Type III (modem only)

C. Supporting Breakdown - Mod/Installation for Basis Platforms

For each of the following platforms, target non-recurring cost, recurring labor cost and recurring A-Kit cost:

- F-16 - Full-up
- A-10 - Full-up
- OV-10- Full-up
- F-15 - Partial Array
- F-4 - Partial Array
- E-3A - Modem only
- CRC - Modem only
- FACP - Modem only
- TACP - Partial Array (mobile platform only)

Note that Table 3-I consists of three parts. Part A contains a breakdown of LCC by type of expense. Part B provides a supporting breakdown of prime mission equipment by type of configuration and by airborne or ground-based host platform. Part C is a breakdown of selected modification/installation costs by the "basis" platform types listed in Section 3.3 above.

The baseline shall be used as a point of departure for parts (b), (c), (d) and (e) defined below, and shall not be changed without written consent of the Air Force. The baseline shall be reported in the first draft of the LCC Document defined in the CDRL.

(b) Accuracy Study. The contractor shall make an accuracy study of selected contractor input parameters to the LCC. The following parameters shall be included:

PRODUCTION:	TUPP(NP), TUPT(NP) - Unit Terminal costs UP(I) - Unit ITEM Cost
MOD/INSTALL:	NRMI(NP) - non-recurring cost AKIT(NP), MIMH(NP) - Recurring cost parameters
OPERATIONS:	MMPD(NP), MMPM(NP) - labor minutes per day and per mission
SUPPORT:	PMTBF(I) - reliability RM(I) - repair materials factors BCMH(I), BMH(I), DMH(I), RMH(I) - maintenance times CSE(L), MSE(L) - support equipment cost parameters

See Appendix I of Volume II of this User's Manual for definitions of these parameters.

For each of the parameters identified above, the contractor shall estimate an optimistic value and a pessimistic value about the mean value utilized in part (a) above. These shall be estimated such **that they represent approximately one standard deviation on each side of the mean (i.e., the 16th and 84th percentile, while the mean is about the 50th percentile). The contractor shall also** provide computer runs of the LCC Model with all optimistic and with all pessimistic parameter inputs, to supplement the run with all mean values that was carried out in part (a).

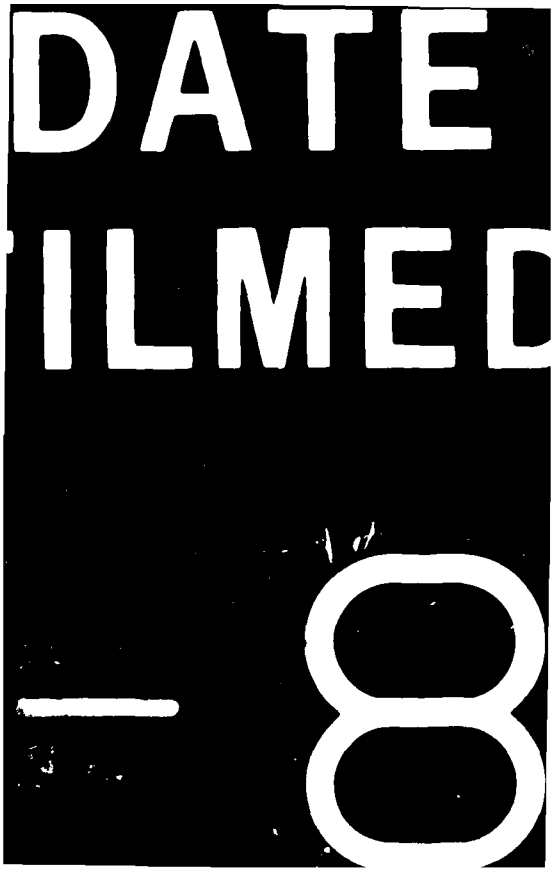
(c) LCC Target Management. The contractor shall establish rational targets for total LCC partitioned to the data elements shown in Table 3-I. Targets shall be formally established in the format of Table 3-I and reported to the Air Force in the first draft

of the LCC Document defined in the CDRL. In addition, the contractor shall compute differences between cost estimates and cost targets. The contractor shall carry out a dynamic program for driving the LCC cost estimates toward the established targets.

It must be stressed that the objective of the cost element targeting is to minimize total LCC. This is of course different from minimizing cost elements individually. In performing trade studies, contractors may find that a lower total LCC may be obtained by increasing cost in one area in order to accomplish a greater reduction in some other area. Thus, for example, an upgrading of component reliability might increase unit production cost, but provide an overall reduction in LCC by decreasing support cost. Hence, it is not necessary that targets for all cost elements be lower than the corresponding cost estimates; some may be higher.

(d) Maintaining a Current LCC Estimate. The LCC data file shall be updated concurrently with engineering and program decisions. For each change in the LCC estimate the contractor shall maintain a record of the change, the reason for its implementation and the resultant change in LCC. Current estimates shall be maintained for the data elements shown in Table 3-I.

(e) Results of LCC Management. LCC management efforts shall be documented in accordance with the CDRL and presented at all Government contractor program reviews. The contractor shall carry out an aggressive program to publicize program LCC objectives and accomplishments to project personnel, suppliers and sub or associate contractors.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